

Commutative Property – changing the order does not affect the answer

Addition: $a + b = b + a$

Add $3 + 8 = 8 + 3$
 $11 = 11 \checkmark$

Multiplication: $a \cdot b = b \cdot a$

Mult. $3 \cdot 4 = 4 \cdot 3$
 $12 = 12 \checkmark$

doesn't work

Sub $11 - 3 \neq 3 - 11$
 $8 \neq -8$

Division

$24 \div 8 \neq 8 \div 2$

$3 \neq \frac{8}{24}$

$3 \neq \frac{1}{3}$

Associative Property – Changing the grouping of the numbers does not affect the answer

Addition: $a + (b + c) = (a + b) + c$

Add $(8 + 2) + 3 = 8 + (2 + 3)$
 $10 + 3 = 8 + 5$
 $13 = 13 \checkmark$

Multiplication $(a \cdot b) \cdot c = a \cdot (b \cdot c)$

Mult

$(13 \cdot 5) \cdot 2 = 13 \cdot (5 \cdot 2)$
 $65 \cdot 2 = 13 \cdot 10$
 $130 = 130 \checkmark$

Distributive Property – Multiply all numbers inside the parentheses by the number outside of the parentheses (Mama's gotta take care of all those babies!)

$a(b + c) = (a)(b) + (a)(c)$

↑
easier to do in head

Identity Property of Addition/ Additive Identity – any number plus zero is that number

$a + 0 = a$

$12 + 0 = 12$

Identity Property of Multiplication / Multiplicative Identity – any number times one equals that number

$a \cdot 1 = a$

$527 \cdot 1 = 527$

Zero Property of Multiplication – any number times zero is zero

$a \cdot 0 = 0$

$38 \cdot 0 = 0$

Additive Inverse – the sum of a number and its opposite is zero

$-a + a = 0$

$-8 + 8 = 0$